WHAT IS CLAIMED IS:

1. A packet data communications network comprising:

a first network segment having a plurality of stations, one of said stations sending a message packet onto said first network segment of a first format; said first format including a first header and a data field with network destination address in said communications network;

a first network transfer device having an input connected to said first network segment to receive said message packet and having an output; the first network transfer device applying a second header to said message packet, said second header including a switching address translated from said destination address and including local status information;

a switching device having a plurality of ports, a first of said ports being connected to said output of said first network transfer device; the switching device receiving said message packet with said second header and sending said message packet with said second header to a second port as selected by said switching address, and in response to said local status information;

a second network transfer device having an input connected to said second of said ports of said switching device and having an output connected to a second network segment, the second network transfer device receiving said message packet via said switching device to forward to said second network segment; the second network transfer device removing said second header from said message packet.

2. A network according to claim 1 wherein said network has a plurality of links, and each of said links is assigned a link number, and said second header

3    includes a link number for a source of said message packet and a link number for a

4    destination of said message packet.

1        3.  A network according to claim 1 wherein said destination address contains

2    N bits, and said switch address contains M bits, where N and M are integers and N

3    $> > M$.

1        4.  A network according to claim 3 wherein said packet includes a network

2    source address of N bits, and said added header contains a source switch address of

3    M bits translated from said network source address.

1        5.  A network according to claim 4 wherein said switching device is a crossbar

2    switch.

1        6.  A network according to claim 5 wherein said first network segment is a

2    serial FDDI link, and said ports are parallel ports.

1        7.  A network according to claim 6 wherein said added header contains a

2    service class field, and said switching device processes said packet in response to said

3    service class field.

1        8.  A network according to claim 7 wherein said added header contains a

2    protocol class field, and said switching device processes said packet in response to

3    said protocol class field.

1      9.  A network according to claim 8 wherein said added header contains a status

2      field indicating local congestion, and said switching device processes said packet in

3      response to said status field.

1      10.  A method of operating a packet data communications network, the

2      network including a first network segment having a plurality of stations and a second

3      network segment having a plurality of stations, and including a switching device

4      interconnecting said first and second segments, comprising the steps of:

5      sending from one of said stations of said first network segment a

6      message packet of a first format onto said first network segment; said first format

7      including a first header and a data field with a network destination address in said

8      communications network;

9      receiving said message packet at a first network transfer device having

10      an input connected to said first network segment; the first network transfer device

11      applying a second header to said message packet, said second header including a

12      switching address translated from said destination address and including local status

13      information;

14      receiving at said switching device said message packet with said second

15      header and sending said message packet with said second header to a port of said

16      switching device as selected by said switching address, and in response to said local

17      status information;

18      receiving said message packet at said second network transfer device

19      via said switching device and forwarding said message packet to said second network

20      segment; the second network transfer device removing said second header from said

21      message packet.

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| 1 | 11.  A method according to claim 10 wherein said network has a plurality of |
| 2 | links, and each of said links is assigned a link number, and inserting in said second |
| 3 | header a link number for a source of said message packet and a link number for a |
| 4 | destination of said message packet. |

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| 1 | 12.  A method according to claim 10 wherein said destination address contains |
| 2 | N bits, and said switch address contains M bits, where N and M are integers and N |
| 3 | $>>$ M. |

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| 1 | 13.  A method according to claim 12 wherein said packet includes a network |
| 2 | source address of N bits, and inserting in said added header a source switch address |
| 3 | of M bits translated from said network source address. |

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| 1 | 14.  A method according to claim 13 wherein said switching device is a |
| 2 | crossbar switch. |

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| 1 | 15.  A method according to claim 14 including transmitting on said first |
| 2 | network segment by the serial FDDI method, and ports between said switching device |
| 3 | and said transfer devices are parallel ports. |

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| 1 | 16.  A method according to claim 15 including inserting in said added header |
| 2 | a service class field, and said switching device processes said packet in response to |
| 3 | said service class field. |

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| 1 | 17.  A method according to claim 16 including inserting in said added header |
| 2 | a protocol class field, and said switching device processes said packet in response to |
| 3 | said protocol class field. |

1      18. A method according to claim 17 including inserting in said added header

2     a status field indicating local congestion, and said switching device processes said

3     packet in response to said status field.

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